# MUSIC INTERVENTION FOR STRESS REDUCTION (MISTRESS)

## Pilot Project 2018 with Test of the Calming Effect of Using inmu for Stress Reduction

EXECUTIVE SUMMARY

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### I. AIM

The project investigates the effects of music intervention for stress reduction in relation to the inmu adaptive music system. Through lab experiments involving physiological measurements and psychometric testing, the hypothesis that adaptive music stimulus (using the inmu) has a better stress reducing effect on a group than a control group with no music. The methodology involves a stressor that invokes physiological and psychological stress, after which the reduction in stress level as described by the different stress indicators is measured and analyzed for both groups.

The experiment has three distinct phases. This includes 5 minutes of baseline readings in order to account for baseline changes across subjects, 5 minutes of a game-like task designed to invoke a stressful state in the subjects, and 15 minutes of a destressor period. A total of 17 subjects enrolled for the experiment. 9 and 8 subjects were randomly assigned to one of the 2 condition groups respectively: i) inmu and ii) No inmu (Control). These were the two different destressors tested with hypothesis being that the condition i) is a better destressor than the control ii). Stress reduction was assessed via Subject's reduction in heart rate, Subject's increase in skin resistance levels, and Subject's answers to psychometric testing questions.

### II. RESULTS

Physiological Measurements

Using heart rate and skin resistance as independent surrogates to stress levels, it was shown that:
The percentage of subjects that were able to destress was greater in the group using the inmu than in the control group. Heart Rate: 71.4% vs 66.7%, Skin Resistance: 43% vs 33% for INMU and control group respectively.

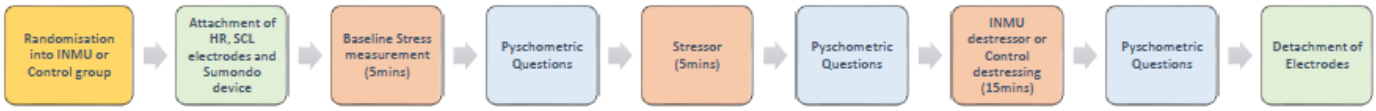
For the subjects that were able to destress in the control group, the destressing magnitude was still lower than those subjects that destressed in the group using the inmu.

Trajectories of the heart rate and skin resistance during the 15 minute destressing period were also analyzed for both groups. A faster reduction (within the first minute) in heart-rate is observed for the INMU group compared to the control group. This reduction is sustained throughout the 15 minute period. For the skin resistance, the INMU group exhibited a rate of destressing greater to that of the control group.

### III. CONCLUSIONS

As described by qualitative questions and physiological measurements related to stress reduction, it could be shown that music interaction using the inmu device exhibits several stress reducing properties.

### EXPERIMENT SUMMARY




### TRAJECTORIES OF THE HEART RATE AND SKIN RESISTANCE DURING DESTRESSOR

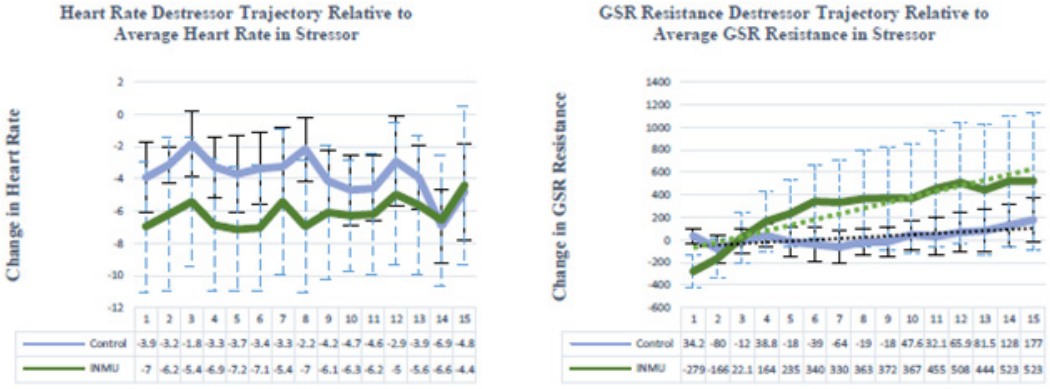



*Figure 3: Trajectories of HR (left) and SRL (right) for the entire destressing period for the INMU (green) and Control (blue) groups. Measurements were averaged over 1 minute time-windows and changes within this window were calculated with respect to the average level in the previous stressor state.*